

## **The Fish Community and Fishery of Lake Leelanau, Leelanau County, Michigan with Emphasis on Walleyes, Northern Pike and Smallmouth Bass**

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### **Introduction**

The Michigan Department of Natural Resources (MDNR), Fisheries Division surveyed fish populations and angler catch and effort on Lake Leelanau, Leelanau County, Michigan from April 2002 through March 2003. This work was part of a statewide program designed to improve assessment and monitoring of fish communities and fisheries in Michigan's largest inland lakes. Known as the Large Lakes Program, it is currently scheduled to survey about four lakes per year over the next ten years (Clark et al. 2004).

The Large Lakes Program has three primary objectives. First, we want to produce consistent indices of abundance and estimates of annual harvest and fishing effort for important fishes. Initially, important fishes are defined as species susceptible to trap or fyke nets and/or those readily harvested by anglers. Our hope is to produce statistics for important fishes to help detect major changes in their populations over time. Second, we want to produce abundance estimates and sufficient growth and mortality statistics to be able to evaluate effects of fishing on special-interest species which support valuable fisheries. This usually involves targeting special-interest species with nets or other gears to collect, sample, and mark sufficient numbers. We selected walleyes *Sander vitreus*, northern pike *Esox lucius*, and smallmouth bass *Micropterus dolomieu* as special-interest species in this survey of Lake Leelanau. Finally, we want to evaluate the suitability of various statistical estimators for use in large lakes. For example, we applied and compared three types of abundance and three types of exploitation rate estimators.

The Large Lakes Program will maintain consistent sampling methods over lakes and time. This will allow us to build a body of fish population and harvest statistics for direct evaluation of differences between lakes or changes within a lake over time. Lake Leelanau was the seventh lake sampled under the protocols of the program; thus, we were sometimes limited in our ability to make valid comparisons. Of course, as our program progresses we will eventually have a large body of netting data collected under the same conditions in the future.

We will refer to fishes by common name in the text. We listed common and scientific names of fish species in Appendix A.